A longitudinal study of MUAC as a measure of paediatric malnutrition in Yei, South Sudan: Lessons from a hospital link

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Background

Paediatric malnutrition is a significant problem in South Sudan, with rates of wasting up to 22% reported in some areas [1]. Severe acute malnutrition (SAM) is associated with a high mortality [2]. Affected patients require thorough assessment and holistic care including appropriate therapeutic feeding, treatment of associated complications and rehabilitation in order to achieve good outcomes.

Since 2009 there has been an NHS Global Link between Yei Civil Hospital (YCH), Central Equatoria Province and Royal Hampshire County Hospital, Winchester, UK. It had been noted that there was very minimal provision for malnourished children in the town (total population in Yei was estimated at 185,000 in 2011). Successive teams from the link therefore assessed the levels of acute paediatric malnutrition in order to supply data to the South Sudanese government and its partners such as UNICEF in order to facilitate decisions as to whether increased provision is warranted.

The measurement used was the Mid-Upper Arm Circumference (MUAC) which is a well-validated indicator of acute malnutrition [3, 4, 5, 6], and is recommended by the World Health Organization (WHO) [7] and the 2009 interim South Sudanese guidelines [8] as a key assessment tool.

Methods

Data were collected during three defined periods between 2012 and 2014:

- Period 1: Oct-Dec 2012 (3months);
- Period 2: June 2013 (10 days);
- Period 3: Oct 2014 (10 days).

MUAC was measured using standardized colour-coded tapes, and by the method described by UNICEF [9] – see Figure 1.

MUAC measurements were collected for all available inpatients and ambulatory care patients aged 6 months to 5 years at YCH, Martha Primary Care Clinic (MPCC), and during mobile clinics (MC) in rural areas over the study periods. The age and sex of each patient was recorded. Measurements were categorized using a traffic light system as shown in Table 1.

All measurements were taken with the verbal consent from a parent, and all results indicating acute malnutrition were flagged to local attending medical staff and explained to the parents. Data from successive years and for each site were compared.

Results

Table 2 shows the nutritional status of the 601 children assessed, and the rate of acute malnutrition by year and site.

Discussion

The data show similar high levels of malnutrition in successive years and different sites, which are concerning and compare poorly to reported rates of 6 – 9% in neighbouring countries [11, 12, 13]. Data from 2014 show that current rates of acute malnutrition in South Sudan are above 15% - the WHO threshold for nutrition emergencies [14] although the numbers in this year are relatively small.

At present there are no coordinated programmes in Yei for the management of severe acute malnutrition, and there is no local provision of specialist milks such as F75 and F100, or ready-to-use foods (RUTF) such as Plumpy Nut. We hope these data can be used to advocate for increased provision for SAM management in Yei, in order to improve mortality and morbidity in the paediatric

Table 1. Interpretation of mid-upper arm circumference (MUAC) values for children aged 6 - 59 months [10].

Arm circumference	Colour on tape	Indicates
>125 mm	Green	No acute malnutrition
≥ 115 to < 125 mm	Orange	Moderate acute malnutrition (MAM)
< 115 mm	Red	Severe acute malnutrition (SAM)

Table 2. Number and percent of children according to their MUAC category by year and site.

Year	Site	MUAC Category			Total rate of acute malnutrition (MAM + SAM) %	Total rate of SAM %
		Green (%)	Orange (%)	Red (%)		
2012	YCC	223 (88.8)	20 (8.0)	8 (3.2)	11.4	3..3
	MPCC	175 (88.4)	16 (8.1)	7 (3.5)		
2013	YCH	31 (86.1)	4 (11.1)	1 (2.8)	12.6	3.1
	MPCC	31 (86.1)	4 (11.1)	1 (2.8)		
	MC	19 (90.5)	1 (4.8)	1 (4.8)		
2014	YCH	20 (76.9)	3 (11.5)	3 (11.5)	15.6	5.3
	MPCC	28 (90.3)	3 (9.7)	0		

population there.

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Figure 1. Measuring MUAC. The colour on the tape is orange so the child has moderate acute malnutrition (MAM). Image reproduced courtesy of UNICEF Ethiopia.

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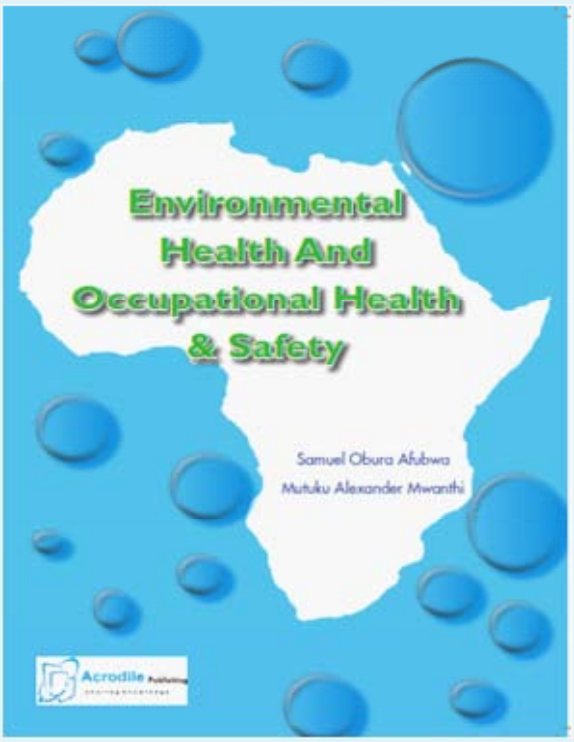

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